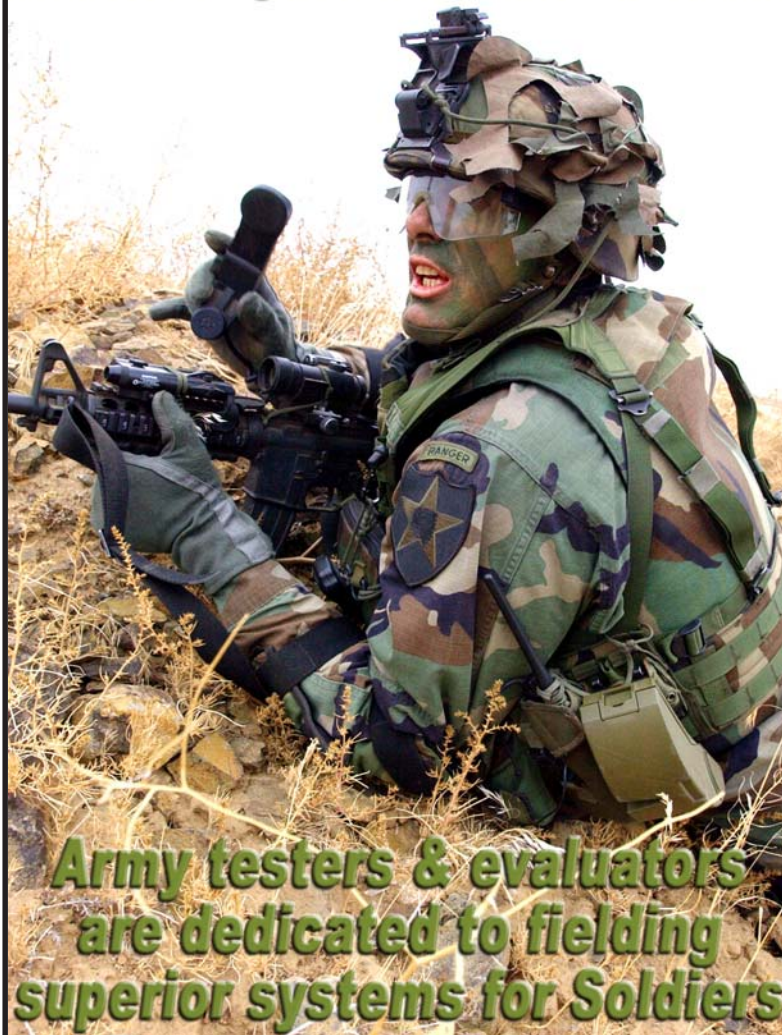




***Saving the lives  
of Soldiers is  
priority No. 1***



***America's global war on terrorism***



***Army testers & evaluators  
are dedicated to fielding  
superior systems for Soldiers***



## ***Developmental Test Command plays crucial support role for Soldiers fighting terrorism***

**A**s America's armed forces combat terrorism in Iraq and Afghanistan, the Army personnel who test and evaluate everything from boots to ballistic missiles are focused on providing Soldiers with weapons and equipment that will not fail the crucial test when needed most.

Testers and evaluators are doing some of this work within very tight deadlines while the Army moves as quickly as possible to field new systems or improved versions of fielded weapons and equipment. Maj. Gen. Robert Armbruster, former commander of the Army Test and Evaluation Command (ATEC), had sent a memorandum to the roughly 9,000 Soldiers,



*Photo by Sgt. 1st Class Milton Robinson*

***A Soldier assigned to A Company, 2/505th Parachute Infantry Regiment, 82nd Airborne Division, provides security while his unit searches for a large cache of weapons in Afghanistan.***

***DTC Page 2***



*Photo by Spc. Clinton Tarzia*

***Soldiers of the 3rd Infantry Brigade, 2nd Infantry Division, conduct reconnaissance with the aid of the Stryker in Samarra, Iraq. The Developmental Test Command tested the Stryker's slat armor to ensure it could help shield Soldiers against attacks.***

civilian employees and contract personnel in his command, emphasizing that they are no longer conducting business as usual.

Armbruster's memo urged ATEC testers and evaluators to seek ways to accelerate their project schedules whenever possible to meet emerging Army requirements.

Even before the start of military operations in the Middle East, Army testers and evaluators had been working within an accelerated schedule to help the Army field its new Stryker combat vehicle. The Army Developmental Test Command (DTC) has been a major player in the Army's efforts to field the Stryker as well as other systems now in

use on the battlefield. DTC is the ATEC subordinate command that conducts performance and safety tests of military systems before Soldiers put them to the test in an operational scenario.

### ***Stryker protection***

In June 2003, Armbruster directed DTC to pursue a prototype add-on armor package for the Stryker. A cooperative effort involving DTC; the Aberdeen Test Center (ATC); the Program Manager, Brigade Combat Team (PM BCT); the Army Research Laboratory (ARL); and General Dynamics resulted in an armor enhancement system for eight of the 10 Stryker variants. The



Army testers had to work within a tight schedule to help the Army field its new Stryker combat vehicle.

goal was to beef up the protection the Stryker affords against rocket-propelled grenades, or RPGs. The solution was called "slat armor" because it resembles a cage made of metal slats. Engineers designed the slat armor for the infantry-carrier, reconnaissance, command, fire-support, anti-tank-guided-missile, mortar-carrier version A, engineering-squad, and

medical-evacuation variants of the Stryker.

After the Army approved the design of the armor kits in July 2003 and ordered the first kits, ATC began fabrication and testing. ATC then teamed up with the Stryker manufacturer, General Dynamics Land Systems (GDLS), to integrate the add-on armor into the eight variants.

DTC also brought the Training and Doctrine Command Systems Manager into the program, to obtain user input in developing optimum recommended stowage plans for the vehicles' combat loads.

After ATC built the first 20 kits for the infantry-carrier Stryker, it shipped them to Fort Lewis, Wash., in August 2003. The receiving Brigade Combat Team units installed the kits



*Photo courtesy of YPG Public Affairs*

***The Army's new Stryker combat vehicle underwent rigorous testing at the Developmental Test Command's Yuma Test Center in Arizona, in an environment similar to that of Iraq.***

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**Stryker variants  
fired well over  
100,000 rounds  
during the rugged  
desert testing that  
took place at the  
Army's Yuma  
Proving Ground in  
Arizona.**

immediately so they could train with them before deploying to Iraq in October 2003.

Before the Army fields systems to Soldiers for operational testing or use, DTC confirms that these systems will not compromise the safety of the troops using them. In August 2003, DTC issued a safety confirmation for the kit designed for the infantry-carrier variant. DTC headquarters staff ultimately completed safety confirmations for the other Stryker armor kits as GDLS continued to manufacture them.

In addition to testing the ballistic protection provided by the slat armor, ATC conducted automotive and performance tests of the Stryker vehicles equipped with slat armor. Tests included turning, braking, side-slope and grade operations, hilly cross-country

maneuvers, driving across simulated obstacle courses, towing, and various other vehicle performance tests. Human-factors engineering tests included assessments of the potential safety hazards associated with the slat armor, including installation, emergency ingress and egress, the effort required to open and close hatch doors, and the fields of fire for onboard weapons and night vision devices.

Yuma Proving Ground in southwestern Arizona put 150,000 grueling road miles on the Stryker over gravel roads, pavement, cross-country, and all sorts of rough terrain. Like the staff at other DTC test centers that conducted Stryker tests, Yuma's test experts worked seven days a week on a round-the-clock basis to test eight variants of the Stryker armored vehicle on a tight schedule.

The Stryker variants fired well over 100,000 rounds from weapons mounted on the vehicles during testing at Yuma, including nearly 40,000 120-mm projectiles from the Stryker Mortar Carrier.

### ***Armoring Humvees***

The High Mobility Multipurpose Wheeled Vehicle, or HMMWV, has been even more vulnerable to attack by RPGs and other weapons than the Stryker, so the Army needed additional armor as well. The Army's Rapid



*Photo by Staff Sgt. Marvin Daniels*

***This High Mobility Multipurpose Wheeled Vehicle (HMMWV) was damaged by an improvised explosive device during an attack in Iraq.***

Equipping Force and the Program Manager for Light Tactical Vehicles, a subsidiary of the Army Tank-Automotive and Armaments Command, provided kits to DTC and funding to develop and test effective HMMWV armor-protection kits.

Planning for the test program at ATC began in October 2003. Testing was designed to evaluate the kit's ballistic protection as well as the road performance and safety of HMMWVs equipped with the kit. Since then, program managers for heavier tactical vehicles and the U.S. Marine Corps have expressed an interest in similar DTC support.

ATC also has been involved for more than two years with a program to test and evaluate prototypes of the Common Remotely Operated Weapon

Station (CROWS), a system that is currently undergoing an operational assessment in Iraq. This is being done to confirm its suitability, survivability and effectiveness in meeting operational requirements identified by the Military Police Corps in 1999. ATC conducted tests for the system's manufacturer, Recon Optical, Inc., and engineering development tests for the Product Manager, Crew Served Weapons, formerly known as the Program Manager, Small Arms, Picatinny Arsenal, N.J. ATC conducted safety and performance tests of CROWS while the system was solid-mounted, stationary and on a hardstand as well as tests of the system on an M1114 HMMWV. ATC also tested the system on an M1116 HMMWV

for the Air Force. The Developmental Test Command's Cold Regions Test Center at Fort Greely, Alaska, conducted engineering tests of the CROWS on the M1117 Armored Security Vehicle during the summer of 2003.

In November and December 2003, DTC completed the work necessary to provide a safety confirmation for prototype CROWS that were mounted on four M1114 HMMWVs sent to Iraq. This enabled Soldiers to use the system for the ongoing operational assessment under combat conditions.

Before DTC issued the safety confirmation, ATC

completed some additional automotive testing as well as some electronics tests. These tests were conducted to integrate the system with the HMMWV. The tests enabled representatives of the product manager to ensure that appropriate modifications were made to the systems before their operational use.

At the time this article was written, ATC also was planning to conduct a production prove-out test of the latest version of CROWS in March to June 2004.

The West Desert Test Center (WDTC) at Dugway Proving Ground, Utah, is planning to conduct testing this summer to assess the system's survivability when subjected to nuclear, biological and chemical attack.



*Photo courtesy of TACOM Public Affairs*

***The Army Developmental Test Command has been testing the "up-armored" HMMWV as well as armor kits designed for installation on other vehicles.***



DTC's White Sands Test Center (WSTC) at White Sands Missile Range, N.M., is planning to conduct electromagnetic effects testing on the CROWS following the production prove-out test at ATC.

### **Smart-bomb tests**

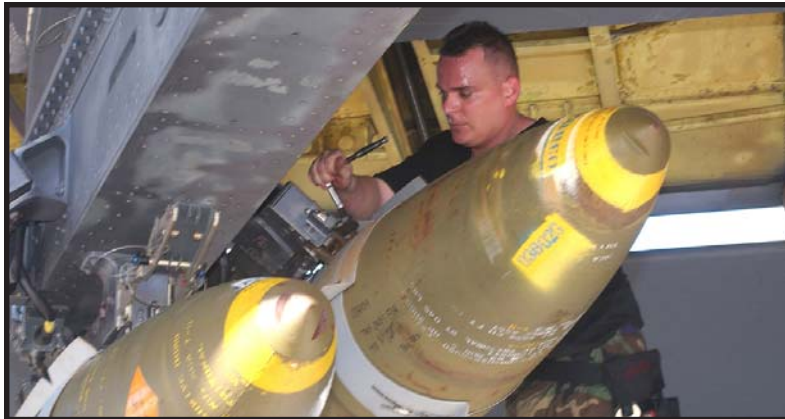
White Sands has tested an array of critical systems as the United States prepared for Operation Iraqi Freedom, including "bunker buster" bombs, the Joint Air-to-Surface Standoff Missile (JASSM), the Army Tactical Missile System (ATAMCS), Multiple Launch Rocket System (MLRS), the Patriot and the Patriot Advanced Capability-3 (PAC-3) Missile.

Some conventional and advanced weapons-effects tests are used to evaluate the

capabilities of warheads to penetrate various materials such as soil, concrete and bedrock. Other tests determine a warhead's ability to suppress hardened tunnel targets.

Testing of the MLRS, which proved its effectiveness in the first war against Saddam Hussein, has been completed at White Sands using both the tracked launcher and the newer High Mobility Artillery Rocket System launcher. A guided version of the MLRS is being tested at White Sands. Testing at White Sands will help the Army assess the effectiveness of both launchers for ATACMS.

The Aerial Cable Range at White Sands, the longest unsupported cable span in the world, was used to test an air-defense system that would

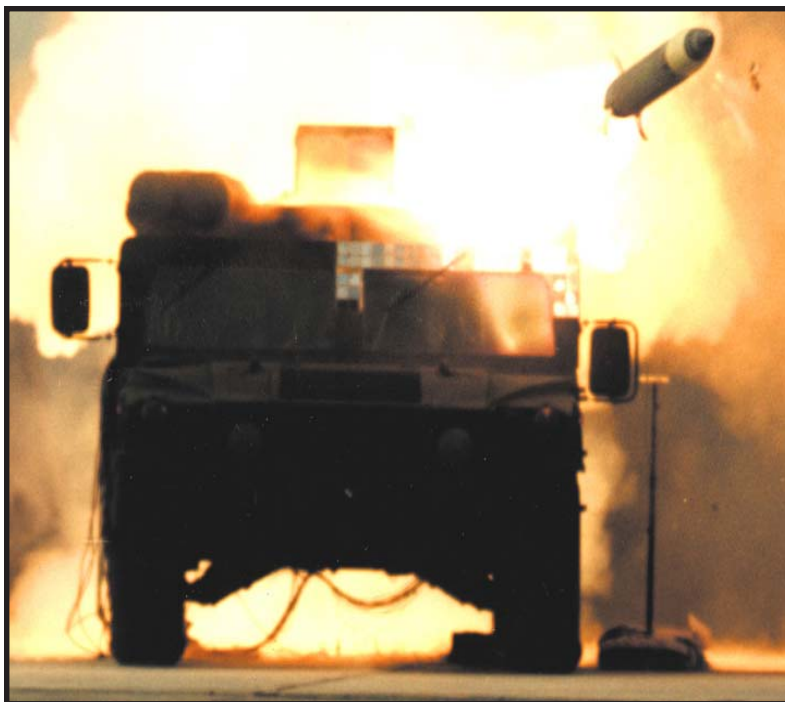


*Photo by Tech Sgt. Janice Cannon*

**An Airman with the 40th Expeditionary Maintenance Squadron, secures a GBU-31 Joint Direct Attack Munition (JDAM) to a B-52 Stratofortress for a bombing mission. The Army Developmental Test Command tested this weapon at its White Sands Missile Range.**

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*Photo courtesy of WSMR Public Affairs*

***White Sands Missile Range tests a broad variety of missiles, ranging from those that can be fired by a single Soldier to strategic systems.***

enable large aircraft to detect and avoid attack from shoulder-launched missiles. Suspended between two mountain peaks, the cable provides a path for target vehicles that can weigh up to 20,000 pounds. It is used to test bombs, sensors, missiles, prototype aircraft, electronic equipment and munitions smaller than missiles.

The Defense Threat Reduction Agency conducts tests at White Sands to evaluate the lethality of conventional and advanced weapons against various targets. These tests help the

United States develop and field new technologies that reduce the threat of weapons of mass destruction (WMD). Mock enemy targets, including deeply buried and concrete-reinforced structures, are used to test weapon systems. DTRA's counterterrorism tests at its White Sands test bed examine the means to protect people and property from a terrorist attack. The Army's Training and Doctrine Command Analysis Center has used White Sands test facilities to conduct computer modeling and simulation for disaster control.

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## Support at Dugway

Testers at Dugway Proving Ground have supported America's global war on terrorism in a variety of ways.

WDTC's Meteorology Division has continued to develop and deploy new components of the Four-Dimensional Weather System, known as 4DWX. A key component is the Global Meteorology on Demand system, or GMOD, which supports testing at all of DTC's test ranges. The 4DWX system has provided test directors with critical information about wind speed and direction in the vicinity of the release of a chemical or biological stimulant, up to 24 hours before a test. This information gave team scientists sufficient lead time to set up detector equipment in the appropriate place to maximize data collection. The system also has been used as a tool to

determine whether testing should be delayed until more favorable meteorological conditions appeared.

GMOD provides high-resolution weather analyses and forecasts for Afghanistan and Iraq, used by the National Guard Ground Intelligence Center (NGIC) to help it model the possible atmospheric dispersion of chemical or biological agents after their release.



*Photo by Al Vogel*

***A Soldier takes a water sample from a "pond" constructed of sheet plastic during a training exercise for NATO forces at Dugway Proving Ground. DTC's test center at Dugway provides training in detecting and responding to chemical and biological agents, for law enforcement and government agencies as well as the military.***

**The Meteorology Division at the Army's Dugway Proving Ground has developed a unique weather-modeling system for its test program.**



*The West Desert Test Center at Dugway Proving Ground has lab facilities rated for testing biological as well as chemical warfare agents. In addition to testing defensive systems for the military, this DTC test center trains Weapons of Mass Destruction Civil Support Teams.*

*Photo by Al Vogel*

This system also was used to support **Joint Urban 2003** in Oklahoma City, Okla., the largest urban dispersion study ever conducted. This test, financed by the Defense Threat Reduction Agency, the Department of Energy and the Department of Homeland Security, was designed to provide a better understanding of the dispersion of chemical

and biological agents in urban areas.

In addition to meteorological modeling and forecasting, Dugway's Meteorology Division has been actively using the state-of-the-art atmospheric dispersion modeling programs to support testing chemical and biological defense systems that involve the release of simulants. This

*Specialists at Dugway Proving Ground provide training to law enforcement agencies and other government organizations responsible for responding to weapons of mass destruction incidents.*



*Photo by Al Vogel*

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work enabled Dugway to provide nearly real-time assessment of atmospheric conditions to test officers conducting tests that simulated nuclear, chemical and biological effects on the Stryker that is currently in use in Iraq.

The Meteorology Division's ability to provide information about the vertical thermodynamic structure of the atmosphere has supported several Air Force test programs. Upper air measurements have supported "smart bomb" tests on Dugway Proving Ground and nearby. Meteorology Division staff have also supported other tests, including tests of the Advanced Cruise Missile (ACM), the Air Launched Cruise Missile (ALCM), the Joint Direct Attack Munitions (JDAM), the Joint Service Operational Weapon (JSOW), and various tests involving the B-1B bomber. These weapons were used with exceptional results in Afghanistan and Iraq.

Any outdoor testing at Dugway and in the adjacent Air Force ranges will benefit from the Meteorology Division's weather forecast modeling and dispersion modeling expertise. A continually improving network of surface, remote sensing, and upper air meteorological instruments provides much of the information used to create the forecast models. This combination of sensors,

models and people capable of interpreting the data and model output enables Dugway Proving Ground to continue its critical support for the war on terror and Operation Iraqi Freedom.

## **Shielding air crews**

DTC's Aviation Technical Test Center (ATTC) at Fort Rucker, Ala., has been assisting the Army in its efforts to develop, test and field the Ballistic Protection System, to shield aircraft crew from small-arms fire.

The system is currently in use on the Special Operations Command's modified Black Hawk and Chinook helicopters. The office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology had requested this system for Black Hawks and Chinooks conducting Army operations in both Iraq and Afghanistan. The Army's

**The Aviation  
Technical Test  
Center has been  
assisting the Army  
with its efforts to  
provide ballistic  
protection for air  
crews.**



*Para-rescuers from the 101st Expeditionary Rescue Squadron practice their fast rope technique from an HH-60 Black Hawk Pave helicopter during a search and rescue training exercise at Baghdad International Airport. DTC's Aviation Technical Test Center tested the Ballistic Protection System, a crew-protection system in use in Black Hawk and Chinook helicopters.*

Aviation and Missile Command performed ballistic testing in 2001, and the Special Operations Command accepted the level of protection provided by the system.

ATTC staff witnessed testing in January 2004 at Hunter Air Force Base in Georgia to integrate the system with the Chinook, and they will provide additional support and testing required for an "airworthiness

release." ATTC is also prepared to conduct additional safety testing to support the safety-confirmation requirements associated with the aircraft. This testing is needed to assess how the system's added weight affects aircraft handling.

Testing will enable DTC to provide a safety confirmation for each configuration of this system and for each type of aircraft using it.

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## ***Destroying missiles***

DTC's Redstone Technical Test Center (RTTC) at Redstone Arsenal, Ala., sent technicians to Iraq in July 2003 to help the Army safely deal with missiles Iraqi forces had abandoned during Operation Iraqi Freedom. The chief of the center's Static Test Branch and four others volunteered for the mission, which they completed in November 2003.

The team removed oxidizer from Iraqi SA-2 and Al Samoud missiles for safe transport and accompanied the explosive-ordnance-disposal convoy to the disposal site, where they put the oxidizer into 55-gallon drums. They watched over the disposal operation as Soldiers

put C4 plastic explosive on both the missiles and the drums. The ordnance-disposal team destroyed 51 missiles, including five Al Samouds. The SA-2s were Russian missiles that dated back to the 1960s.

The abandoned missiles were found throughout the countryside in Iraq – at former military bases, beside a water treatment plant, next to Baghdad International Airport, at a soccer stadium and next to a date grove. They had been stripped but were not designed to be transported in their fully fueled state.

The RTTC crew had to be mindful of safety as they rendered the missiles transportation-safe.



*Photo courtesy of the Joint Combat Camera Center*

***The Javelin Missile, one of the crucial weapon systems used in the war against terror, underwent rigorous testing at DTC's Redstone Technical Test Center.***

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*Photos courtesy of YPG Public Affairs*

***Yuma Proving Ground in southwestern Arizona is an ideal place for conducting desert testing - a place where the grit and dust of its rugged range roads and the soaring heat make rigorous testing possible. Systems such as the Bradley Fighting Vehicle (above) endured choking dust at Yuma during automotive testing. YPG also has a desert airfield, where the C-130 (below) underwent testing.***



## Training at Yuma

Yuma Proving Ground not only has been an excellent place to test systems intended for use in the deserts of Iraq and Afghanistan; it is also provides the right environment for desert and special operations training. The Special Operations Command has established its Special Operations Terminal Air Controller Course (SOTACC), at Yuma to take advantage of the open air space and rugged terrain.

SOTACC students from all of the military services, but primarily from the Army, learn at Yuma to call in close air support strikes on the battlefield, and they get a chance to practice what they learn. Four or more SOTACC courses per year take place at

Yuma Proving Ground, where students conduct numerous field missions before graduating. The Army needs to train about 700 Soldiers in

The harsh terrain at Yuma Proving Ground makes it an ideal place to test systems that must perform well in the desert.

*A Soldier with the 101st Airborne Division (photo below) trains in the field at Mosul, Iraq, during an exercise to teach Soldiers how to call in close air support.*



*Photo by Sgt. Curtis Hargrave*

these special-operations skills, and because the other services could not accommodate this requirement, SOTACC came to Yuma.

Not only does the proving ground offer an extensive firing range for the live fire training needed for each class; it also has renovated a classroom facility for student instruction.

The new SOTACC complex at Yuma will greatly extend the simulated mission activities offered to students when its new simulation lab is added. Staff helped the Special Operations Command conduct this course by installing targets in the designated live-fire area

on the range. These targets can represent threat vehicles, a convoy, a bunker or a building.

Special-operations units such as Navy SEALs and Army Special Forces have conducted desert training on Yuma's Cibola Range before they deployed to Southwest Asia for specific missions.

## **Desert UAV testing**

Special operations troops as well as other units have depended heavily upon the use of unmanned aerial vehicles, or UAVs, to conduct reconnaissance operations, target enemy forces and bring



*Photos courtesy of YPG Public Affairs*

*Yuma Proving Ground has been the location of a variety of unmanned aerial vehicle tests for the Department of Defense, including for the Navy and Marine Corps as well as the Army. The unrestricted air space and favorable weather for flying make Yuma a good location for aerial testing.*



firepower on them. The use of UAVs in Iraq and Afghanistan is not only saving Soldiers lives but also those of non-combatants by enabling precision targeting. DTC has been a key player in the testing of UAVs, principally at three of its test centers: the Aberdeen Test Center, the Electronic Proving Ground and Yuma Proving Ground.

At Yuma Proving Ground, for example, a team of UAV and aviation test experts have worked closely with the Deputy Undersecretary of Defense (Advanced Systems & Concepts) to test various types and configurations of UAVs and train teams of military personnel for deployment overseas.

Dozens of UAVs of many shapes and sizes have been tested at Yuma. These include the hand-held Snake Eye and Pointer UAVs to the much larger Pioneer. Others include

The use of UAVs has not only saved the lives of Soldiers; it has also reduced civilian casualties by making strikes at the enemy more precise.

the Tern, Mako, and Hawkeye. Some were launched from helicopters and fixed wing cargo aircraft during testing, all of which took place in the skies over the proving ground. Over 50 variants of UAVs and sensor systems have come to the proving ground over the past year, with three-fourths being deployed directly to the



*Photo courtesy of YPG Public Affairs*

**Yuma Proving Ground has the vast acreage necessary to test military artillery systems as well as projectiles.**

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DTC test ranges acquire test data in a variety of ways, including using ultra-high-speed cameras to record the flight of projectiles such as this TOW Missile fired from a Bradley Fighting Vehicle.

*Photo courtesy of YPG Public Affairs*

Persian Gulf.

An array of re-supply pods have been developed at the proving ground for mounting on the undercarriages of UAVs that re-supply friendly forces. These pods can carry a variety of items, including medical supplies, food and ammunition. The UAV itself is controlled by global positioning (GPS), which means that a person doesn't necessarily have to be in the loop.

Yuma Proving Ground has constructed facilities specifically aimed at meeting UAV test needs. Several asphalt runways have been built, totaling 7,000 feet in length, as have office and maintenance areas. Planning is under way to expand and build new facilities to meet the increased UAV test workload of the future.

The Office of the Secretary of Defense Joint Experimentation Range

Complex at Yuma greatly expands the proving ground's ability to conduct specialized tests, many directly in support of the global war on terrorism. The range features remote desert terrain and airspace with fully controlled access, providing a realistic rural and urban environment. It contains miles of varying types of roads, including dirt and gravel roads, paved two-lane and four-lane roads, paved cross streets and dozens of buildings, meant to simulate a small town or city. Buildings range from small sheds to two-story structures.

The range at Yuma also provides an ideal environment for testing advanced sensor technologies. At the range's test track, convoys of military and commercial sport utility vehicles encounter the same conditions and hazards faced by American fighting forces to test sensors and technology.

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**Army Developmental  
Test Command,  
supporting Soldiers  
around the world.**

